

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-8 (Canceled)

Claim 9 (New): A process for fractionating a crude C₄ fraction comprising butanes, butenes, 1,3-butadiene and small amounts of other hydrocarbons including C₄-acetylenes, 1,2-butadiene and C₅-hydrocarbons by extractive distillation using a selective solvent, wherein the crude C₄ fraction is fed into the middle region of a first extractive distillation column and the selective solvent is fed into the column at a point above that at which the crude C₄ fraction is introduced and a gaseous side stream which comprises the C₄-acetylenes together with 1,3-butadiene, 1,2-butadiene, C₅-hydrocarbons and selective solvent and in which the concentration of the C₄-acetylenes is below the spontaneous decomposition limit is taken off from the first extractive distillation column at a point below the feed point for the crude C₄ fraction and an overhead stream comprising the components of the crude C₄ fraction which are less soluble than the C₄-acetylenes in the selective solvent is taken off from the top of the first extractive distillation column.

Claim 2 (New): The process as claimed in claim 9, wherein the gaseous side stream is fed to a first side column in which it is separated into an overhead stream which comprises the C₄-acetylenes and is condensed in a condenser at the top of the first side column and part of it is returned as runback to the first side column while the remainder is taken off and a bottom stream which comprises the selective solvent and is returned to the first extractive distillation column.

Claim 11 (New): The process as claimed in claim 9, wherein a bottom stream is taken off from the first extractive distillation column and is cooled by indirect heat exchange with the crude C₄ fraction, condensed in a condenser and returned as stream to the first extractive distillation column.

Claim 12 (New): The process as claimed in claim 9, wherein liquid or a substream of the liquid is taken off from the first extractive distillation column at a theoretical plate which is one or more theoretical plates below the point at which the gaseous side stream is taken off, the liquid is heated and/or vaporized by indirect heat exchange with the bottom stream from the first extractive distillation column and is returned to the first extractive distillation column on the same theoretical plate or above this point, with the theoretical plate from which the liquid or liquid substream is taken off being chosen so that the energy requirement for the first extractive distillation column is minimized.

Claim 13 (New): The process as claimed in claim 9, wherein the overhead stream from the first extractive distillation column is condensed in a condenser at the top of the first extractive distillation column and part of it is returned as runback while the remainder of the condensed overhead stream is fed to a second extractive distillation column in which it is separated into raffinate 1 and crude 1,3-butadiene.

Claim 14 (New): The process as claimed in claim 13, wherein a partial condensation is carried out in the condenser at the top of the first extractive distillation column and the condensed portion of the overhead stream from the first extractive distillation column is used as runback while the gaseous portion of it is fed to the second extractive distillation column.

Claim 15 (New) The process as claimed in claim 13, wherein an overhead stream is taken off from the second extractive distillation column, condensed in a condenser and part of it is returned as runback to the second extractive distillation column while the remainder is taken off as raffinate 1, and a side stream is taken off from the second extractive distillation column below the feed point for the stream and this is preferably fed to a second side column in which it is separated into an overhead stream which is condensed and part of it is returned as runback to the second side column while the remainder is taken off as crude 1,3-butadiene stream and a bottom stream which comprises the selective solvent and is returned to the second extractive distillation column.

Claim 16 (New): The process as claimed in claim 13, wherein liquid or a substream of the liquid is taken off from the second extractive distillation column at a theoretical plate which is one or more theoretical plates below the side offtake, the liquid is heated and/or vaporized by indirect heat exchange with the bottom stream from the second extractive distillation column and is returned to the second extractive distillation column on the same theoretical plate or above this point, with the theoretical plate from which the liquid or liquid substream is taken off being chosen so that the energy requirement for the second extractive distillation column is minimized.

Claim 17 (New): The process as claimed in claim 15, wherein the side stream which is taken off from the second extractive distillation column below the feed point for the stream is fed to a second side column in which it is separated into an overhead stream which is condensed and part of it is returned as runback to the second side column while the remainder is taken off as crude 1,3-butadiene stream and a bottom stream which comprises the selective solvent and is returned to the second extractive distillation column.